TECHNICAL WORK MAY NOT BEGIN PRIOR TO CO APPROVAL

NASA/GODDARD SPACE FLIGHT CENTER

REQUEST FOR TASK PLAN / TASK ORDER

CONTRACTOR	CONTRACT NO./TASK NO.	JOB ORDER NUMBER	APPROP. FY
QSS Group, Inc.	NAS5-99124 TASK NO. 394 AMENDMENT	(See Page 2)	00

TASK TITLE: (NTE 80 characters; include Project name)

ACMR and Correlation Radiometer Calibration Project RF Engineering Services

APPROVALS: (Type or print name and sign)

	DATE	ORG CODE	MAIL CODE	PHONE
ASSISTANT TECHNICAL REPRESENTATIVE (OR TASK MONITOR) Edward J. Kim for Peter Hildebrand 9/22/00	9/21/00	975	975	301-614-5653
BRANCH HEAD Peter Hildebrand	DATE	CODE 975		PHONE 301-614-5737
CONTRACTING OFFICER'S TECHNICAL REPRESENTATIVE (COTR) for Robert S. Lebair, Jr. Deborah A. Clark	DATE 9/26/00	CODE 560		PHONE 301-286-6588

FLIGHT HARDWARE, CRITICAL GSE OR SOFTWARE? (IF YES, NEED CODE 303 CONCURRENCE NEXT BLOCK)	CONTRACTING OFFICER'S QUALITY REP.	DESIGNATED FAM:
[X] NO [ ] YES		

The contractor shall identify and explain the reason for any deviations, exceptions, or conditional assumptions taken with respect to this Task Order or to any of the technical requirements of the Task Order Statement of Work and related specifications. The contractor shall complete and submit the required Reps and Certs.

(To be completed by Contracting Officer)
C.O. Requested Quote on:
Date:

Contractor will develop specification or statement of work under this task for a future procurement. [X] NO [ ] YES

Flight hardware will be shipped to GSFC for testing prior to final delivery. [ ] NO [ ] YES [X] N/A

Government Furnished Property/Facilities: [ ] NO [X] YES -- SEE LIST OF GFP (offsite only) / FACILITIES (onsite only)

Onsite Performance: [ ] NO [X] YES If yes: [X] TOTAL [ ] PARTIAL
If partial, indicate onsite work in SOW by asterisk (*)

Surveillance Plan Attached: [X] NO [ ] YES

Highlighted Contract Clauses: *(to be completed by Contracting Officer)*

Per Clause H.14, Task Ordering Procedure, subparagraph (f), the effective date of this task order shall be 10/1/00.

INCENTIVE FEE STRUCTURE (check one)
(See Contract NAS5-99124, Attachment K, Incentive Fee Plan)

	___ No. 1	___ No. 2	_X_ No. 3	___ No. 4	___ No. 5
Cost	10%	50%	25%	25%	%
Schedule	15%	25%	25%	50%	%
Technical	75%	25%	50%	25%	%

(To be completed by Contracting Officer)

The target cost of this task order is $ 51,217 .
The target fee of this task order is $ 173 .
The total target cost and target fee of this task order as contemplated by the Incentive Fee clause of this contract is $ 51,390 .

The maximum fee is $ 253 .
The minimum fee is $0.

AUTHORIZED SIGNATURE:

THIS TASK ASSIGNMENT IS ISSUED ACCORDING TO THE CONTRACT CLAUSE "TASK ASSIGNMENTS AND REPORTS"

Theresa J. Becker	11/14/00	Theresa J. Becker
SIGNATURE OF CONTRACTING OFFICER	DATE	TYPED NAME OF CONTRACTING OFFICER

CONTRACTOR'S ACCEPTANCE:

AUTHORIZED SIGNATURE DATE

REQUEST FOR TASK PLAN / TASK ORDER

CONTRACTOR	CONTRACT NO./TASK NO.		
	NAS5-	TASK NO.	AMENDMENT
QSS Group, Inc.	99124	394	

Applicable paragraphs from contract Statement of Work:

JOB ORDER NUMBERS: Costing Order:

975-622-96-09-89 (00)	1st
975-274-55-00-89 (00)	2nd
975-229-04-15-89 (00)	3rd
975-258-70-13-89 (00)	4th
975-622-33-03-89 (00)	5th
555-258-70-15-89 (00)	6th
555-258-70-11-89 (00)	7th

STATEMENT OF WORK: (Continue on blank paper if additional space is required)

This is a follow-on to Task 289 under this contract; uninterrupted transition is required.

See Page 3.

PERFORMANCE SPECIFICATIONS:

Hardware and Software Documentation and Operating Instructions: Technical performance will be based on thoroughness and completeness of written reports. Acceptable performance is that the ATR is satisfied that the material reflects the proper level of technical expertise and meets the objectives of the activity. Documentation shall be delivered to the ATR both as a hard copy and in electronic format via either diskette or email.

Technical Progress Report: Acceptable performance: (1) that the ATR is satisfied that he is being kept informed of the status of work performed and of issues requiring his attention; and (2) the report lists completed hardware and software construction and testing, as well as problems and plans; and (3) the report contains a summary of activities completed, planned activities for the following month, problems, issues and recommended actions. Report shall be provided to the ATR via email at Edward.J.Kim.1@gsfc.nasa.gov.

Management: Performance will be measured against the following metrics: (1) accomplishment of objectives; (2) clear, incremental progress; (3) responsiveness to issues; (4) efficient and appropriate staffing; and (5) coordination with and good working relationship with ATR and other related contractor efforts, if applicable.

APPLICABLE DOCUMENTS:

None.

TASK END DATE: 2/28/01

MILESTONES/DELIVERABLES AND DATES:

See Page 5.

PERFORMANCE STANDARDS:

Schedule: On-time delivery/completion of the deliverables/milestones

Technical: ATR's acceptance of the above

FINAL DELIVERY DESTINATION (NAME, BLDG, ROOM):

Edward J. Kim, building 33, room A426

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NASA/GODDARD SPACE FLIGHT CENTER

REQUEST FOR TASK PLAN / TASK ORDER

Contract NAS5-99124

STATEMENT OF WORK:

Task #: 394

RADIO FREQUENCY (RF) ENGINEERING SERVICES for the AIRBORNE C-BAND MICROWAVE RADIOMETER (ACMR) and the CORRELATION RADIOMETER CALIBRATION PROJECT

SCOPE OF WORK

The Contractor shall provide the personnel necessary to support the radio frequency (RF) engineering efforts described below, including hardware and software engineering services, for two microwave radiometer projects: "ACMR Polarimetric Upgrades and Field Tests" and the "Correlation Radiometer Calibration project."

STATEMENT OF WORK

The Contractor shall provide services as defined in the following subtask statements.

Subtask 1: ACMR Polarimetric Upgrades and Field Tests

The Contractor shall provide RF engineering personnel to support the government in the construction, documentation, and testing of Airborne C-Band Microwave Radiometer (ACMR) instrument upgrades. ACMR is currently a dual-polarized instrument (vertical and horizontal). The polarimetric upgrades will add the capability to measure in-phase and quadrature time-correlations of the vertical and horizontal signals, for a total of four outputs. These new outputs must be calibrated along with the original output signals. The responsibilities of the Contractor may include:

a) Low-level design, construction, and testing of polarimetric RF hardware for the ACMR instrument. This hardware will include C-band (6.8 GHz) RF components (phase shifters, oscillators, splitters/combiners, attenuators, amplifiers, isolators, antenna, etc.); low-noise mixers to downconvert signals from 6.8 GHz to an intermediate frequency (IF) below 1.5 GHz; IF components (phase shifters, filters, splitters/combiners, attenuators, and amplifiers, etc.); associated power supplies and mechanical layout, temperature sensors, and temperature control components. Tests will consist of standard RF/microwave measurements including: gain or loss, phase, noise temperature, frequency, power, isolation, VSWR, impedance, temperature, stability, etc.

b) Low-level design, construction, and testing of correlator hardware and software for the ACMR instrument. This hardware will include high-speed (up to 2 Gb/s) digital circuitry plus associated power supplies and mechanical layout, temperature sensors, and temperature control components. The software shall include computer programs needed to operate this hardware.

c) Low-level design, construction, and testing of calibration targets for the ACMR instrument. This hardware will consist of RF absorber material enclosed in Styrofoam or

Contract NAS5-99124

STATEMENT OF WORK:

Task #: 394

other thermally-insulating containers, along with embedded temperature sensors. Testing will involve standard hot/cold radiometer calibration methodology.

d) Assist with field deployment and field testing of the ACMR instrument, including: loading/unloading equipment onto a truck; driving a small truck to/from a field site; set-up and take-down of ACMR and test equipment at a field site (grass field, farm field, forest, or parking lot); operating ACMR; performing calibrations.
e) Compilation of day-to-day construction documentation and test records. Finished block diagrams, circuit schematics, wiring diagrams, mechanical sketches, test result summaries, and operating procedures at the conclusion of the subtask.
f) Assist with ACMR data processing and analysis (computer programming and preparation of graphs, charts, and tables in Fortran, C, Matlab, or IDL).

Subtask 2: Correlation Radiometers Calibration Project

The Contractor shall provide RF engineering personnel to support the government in the design, development, construction, and testing of a prototype calibration subsystem for correlation microwave radiometers. Correlation microwave radiometers operate by measuring the correlation (in phase and quadrature) of the outputs from a pair of normal non-correlation radiometers. For space applications, on-board calibration is a critical but difficult problem. This project is intended to develop a laboratory prototype calibration system, and eventually (beyond the scope of this Subtask) to develop a low-power, low-mass version for future flight projects.

The responsibilities of the Contractor may include:

a) Low-level design, construction, and testing of a pair of X-band correlation radiometer receivers. This hardware will include X-band (10.7 GHz) RF components (phase shifters, oscillators, splitters/combiners, attenuators, amplifiers, isolators, antenna, etc.); low-noise mixers to downconvert signals from 10.7 GHz to an intermediate frequency (IF) below 1.5 GHz; IF components (phase shifters, filters, splitters/combiners, attenuators, and amplifiers, etc.); associated power supplies and mechanical layout, temperature sensors, and temperature control components. Tests will consist of standard RF/microwave measurements including: gain or loss, phase, noise temperature, frequency, power, isolation, VSWR, impedance, temperature, stability, etc.
b) Assist with low-level design, construction, and testing of hardware and software for a prototype controlled-correlation source subsystem. This hardware will include components as in Subtask 2 (a) plus baseband high-speed (0 up to 1 Gb/s) digital circuitry plus associated power supplies and mechanical layout, temperature sensors, and temperature control components. The software shall include computer programs needed to operate this hardware. Tests will consist of standard RF/microwave measurements including: gain or loss, phase, noise temperature, frequency, power, isolation, VSWR, impedance, temperature, stability, etc.

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Contract NAS5-99124

STATEMENT OF WORK:

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c) Construction and testing of a high-speed digital correlator subsystem. This hardware will include high-speed (up to 2 Gb/s) digital circuitry plus associated power supplies and mechanical layout, temperature sensors, and temperature control components. The software shall include computer programs needed to operate this hardware.
d) Writing and debugging of computer programs needed to conduct the above tests. Analysis of test results (computer programming and preparation of graphs, charts, and tables in Fortran, C, Matlab, or IDL).
e) Compilation of day-to-day construction documentation and test records. Finished block diagrams, circuit schematics, wiring diagrams, mechanical sketches, test result summaries, and operating procedures at the conclusion of the subtask.
f) Assist with low-level design, construction, and testing of a prototype high-speed (at least 200 Mb/s, possibly 10 Gb/s) fiber optic data link.

MILESTONES/DELIVERABLES AND DATES

The contractor shall provide the following deliverables in accordance with the schedule shown below.

1) The Contractor shall provide to the ATR a final summary set of hardware and software documentation and operating instructions (in electronic form & one hardcopy) derived from Subtask 1(e) by the end of the period of performance.
2) The Contractor shall provide to the ATR a final summary set of hardware and software documentation (in electronic form & one hardcopy) derived from Subtask 2(e) by the end of the period of performance.
3) The Contractor shall provide a Technical Progress Report covering both subtasks. The report shall list completed hardware and software construction and testing, as well as problems and plans. The Report is due the 15th of the month reporting on the previous month's activities.

If delays related to procurement of materials or test equipment or delays due to changes in the customer's schedule occur, the period of performance may be extended, but the Contractor will not be liable for these delays. The contractor would temporarily cease work until the delay is resolved.

PLACE OF PERFORMANCE

This effort requires that Contractor personnel work at the customer site (NASA/GSFC, Greenbelt, Maryland). Limited local travel or travel to NASA Wallops or NASA LaRC may be required in support of activities associated with this effort dependent upon field test schedules. These trips, if any, should be of 1-2 days duration each. For budgeting purposes, 1 trip of 1 day duration each to WFF, LaRC, and Washington, DC area can be assumed.